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[CHD 24: Brushware]

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SPECIFICATION FOR BRUSH, CARRIAGE WASHING (WITHOUT HANDLE)
(Second Revision)

(Incorporating Amendment Nos. 1 & 2)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 4

IS 2701 - 1986

Indian Standard

SPECIFICATION FOR BRUSH, CARRIAGE WASHING (WITHOUT HANDLE)

(Second Revision)

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Indian Standard

SPECIFICATION FOR BRUSH, CARRIAGE WASHING (WITHOUT HANDLE)

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 26 May 1986, after the draft finalized by the Brushware Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was published in 1964 and revised in 1978. Considering the availability/non-availability of different raw materials required for the manufacture of brush, carriage washing (without handle), in the first revision, use of horse-tail hair had been recommended and use of brass and copper wire deleted. Moreover, the tolerances on linear dimensions were liberalized.

0.3 In this revision, different types of filling material are being prescribed, namely, mixture of cow-tail hair and cocofibre; and natural cocofibre. In addition, the diameter of staples is increased from 0.8 ± 0.2 to 1.2 ±0.1 mm. Moreover, the thickness of block is being reduced from 60 to 50 mm. Also, use of other preservatives is recommended for block and board.

0.4 This edition 3.2 incorporates Amendment No. 1 (February 2004) and Amendment No. 2 (September 2004). Side bar indicates modification of the text as the result of incorporation of the amendments.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for brush, carriage washing (without handle).

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*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 5060-1969* and IS : 707-1987† shall apply.

2.1 ***Clause deleted***

3. REQUIREMENTS

3.1 Materials — Brush, carriage washing, shall be manufactured from the following materials.

3.1.1 *Filling Material* — There shall be the following two types of filling materials:

a) *Type* 1 *Filling Material* — shall consist of equal proportions of cow-tail hair and natural clean cocofibre, and

b) *Type* 2 *Filling Material* — shall consist of only natural cocofibre.

3.1.1.1 *Cow-tail hair* — It shall be clean, free from dust and other extraneous matter.

3.1.1.2 *Cocofibre* — Selected, straight, thoroughly cleaned, and of natural colour shall be used.

3.1.2 *Timber*

3.1.2.1 Any of the timber species listed in Appendix A shall be used in the manufacture of board and block of the brush (*see* Fig. **1**).

3.1.2.2 The timber shall be reasonably straight-grained and well-seasoned to a moisture content not exceeding 15 percent, when tested by an electronic moisture meter or in case of dispute by oven-dry method (*see* Appendix B).

3.1.2.3 The timber shall be free from brashness, any kind of biological or non-biological deterioration, insect attack, centre-heart (pith), knots (except live pin knots), cracks, warp and any other defects which may reduce the life of the brush or affect its utility.

3.1.3 *Nails*— Steel nails, flat, of the size and diameter as indicated in Fig. 1 shall be used for securing.

3.1.4 *Screws*— 25 mm long.

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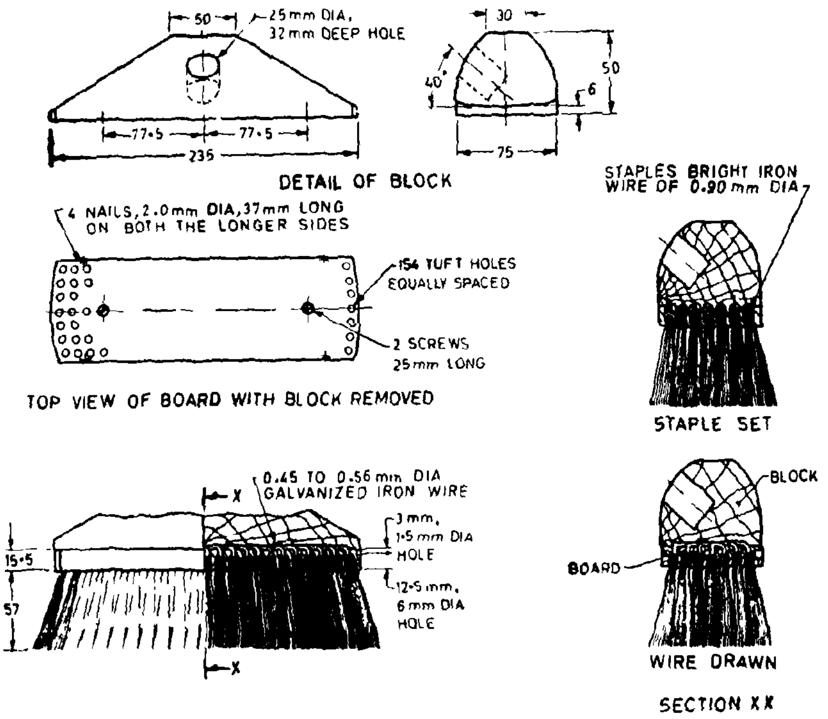
*Glossary of terms used in brushware industry.

†Glossary of terms applicable to timber technology and utilization (*second revision*).


50
25 mm DIA, 32 mm DEEP HOLE
77·5
77·5
235
30
50
40°
6
75
DETAIL OF BLOCK
STAPLES BRIGHT IRON WIRE OF 0.90 mm DIA
4 NAILS, 2.0 mm DIA, 37 mm LONG ON BOTH THE LONGER SIDES
154 TUFT HOLES EQUALLY SPACED
2 SCREWS 25 mm LONG
TOP VIEW OF BOARD WITH BLOCK REMOVED
STAPLE SET
0.45 TO 0.56 mm DIA GALVANIZED IRON WIRE
X
3 mm, 1·5 mm DIA HOLE
12·5 mm, 6 mm DIA HOLE
15·5
57
X
BLOCK
BOARD
WIRE DRAWN
SECTION XX

All dimensions in millimetres.

FIG. 1 BRUSH, CARRIAGE WASHING (WITHOUT HANDLE)

3.1.5 *Wire* — Galvanized iron wire, 0.45 to 0.56 mm in diameter shall be used for fastening tufts of filling material.

3.1.6 *Staples* — Bright iron wire 1.2 ± 0.1 mm diameter shall be used as staples in staple-set brushes.

3.1.7 *Adhesive* — Suitable water-resistant adhesive shall be used for fixing block to board in case of handmade brushes.

3.2 Dimensions and Tolerances

3.2.1 Brushes shall conform to the dimensions given in Fig. 1.

3.2.2 Tolerance on linear dimensions (excepting the dimensions for the filling materials, in which case the minimum length has been given in Fig. 1) are as follows:

Nominal Dimensions mm	*Tolerance* mm
Up to 10	± 1.0
11 to 40	± 2.0
41 and above	± 3.0

3.2.3 A tolerance of ± 0.5 mm shall be allowed on the diameter of the tuft holes.

3.3 Manufacture

3.3.1 Unless otherwise agreed to between the indentor and the manufacturer, the brushes shall conform to the shape and design as shown in Fig. 1.

3.3.2 The block shall be shaped to fit snugly with the board.

3.3.3 The filling material in the form of tufts shall be properly inserted in holes in the board or one-piece block for wire drawn and staple set brushes respectively, as indicated in Fig. 1.

3.3.3.1 *For wire-drawn brushes* — The tufts of filling material shall be firmly drawn into the tuft holes by means of galvanized iron wire and thoroughly bottomed so that they cannot be subsequently knocked back. The back shall be securely glued to the block and reinforced by requisite number of nails and screws as shown in Fig. 1 in such a manner that they do not foul the wire or filling material.

The filling material shall be trimmed straight faced as shown in Fig. 1.

3.3.3.2 *For staple-set brushes* — The tufts of filling material shall be cross-stapled and anchored to the bottom of the tuft holes to give the shape of brush shown in Fig. 1.

The filling material shall be trimmed straight faced as shown in Fig. 1.

3.4 Workmanship and Finish

3.4.1 The block and board shall be finished smooth and suitably treated with a 5 percent solution of copper naphthenate (*see* IS 1078 1973*), creosote oil or any other suitable preservative in petroleum hydrocarbon solvent 60/80 (*see* IS . 1745 1978†)

3 4 2 *Clause deleted*

3.5 Tests

3.5.0 The brushes shall satisfy the following tests

3 5 1 *Pull Test* — None of the filling materials from the tufts shall come out either singly or in bunch when subjected to a straight pull, gripped between thumb and the finger

3.5.2 *Mass of Filling Material per Finished Brush* — Separate the block from the board after removal of the securing nails Unfasten tufts by removal of fastening wire of staples and pull out all the filling material Determine the total mass of the filling material.

3.5.2.1 The total mass of the filling material per brush shall be minimum 220 g for both type of brushes However, for Type 1 brush at least 50 percent of cow tail hair and the rest cocofibre (*see* Appendix C) shall be used A tolerance of ± 5 percent may be allowed on the individual brushes provided the average mass of the filling material per brush is maintained at 220 g

The average mass of the filling material per brush in a lot shall be assessed by taking the average mass of three brushes in a lot not exceeding 300 brushes and of six in a lot exceeding 300 brushes

3.5.2.2 The hair should satisfy the burn test as specified in **8.1** of IS 1844 1975‡.

4. MARKING

4.1 Unless otherwise agreed to between the indentor or inspection authority and the supplier, each brush shall be legibly and indelibly marked or stamped with the manufacturer's name or recognized trade mark, if any, and the year of manufacture

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*Specification for copper naphthenate (*first revision*)

†Specificatlon for petroleum hydrocarbon solvents (*second revision*)

‡Specification for bristles (*first revision)*

4.1.1 In addition to the markings specified in **4.1**, each brush shall contain the particulars of the filling materials, namely, the percentage and the type of filling materials used.

4.1.2 The brushes may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereundcr The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of Inspection, testing and quality control which is devised and supervised by ISI and operated by the producer ISI Marked products are also continuously checked by ISI for conformity to that standard as a further safeguard Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors. may be obtained from the Indian Standards Institution.

5. PRESERVATION

5.1 The filling material of the brushes shall be liberally dusted with a mixture of 5 percent by mass of Lindane 6.5% DP (*see* IS : 14834-2000*) or methyl parathion 2% DP (*see* IS : 8960-1978†) and 95 percent by mass of French chalk (*see* IS : 380-1978‡). Alternatively, pieces of naphthalene balls (*see* : IS : 539-1974§) shall be used in the packing container for the brushes.

6. PACKING

6.1 Brushes should be despatched according to mutual agreement between the indentor and the supplier. In any case the packing shall be done taking full precautions against deformity or any other type of damage that may occur to the brush during transit.

7. SAMPLING

7.1 Representative samples for test shall be drawn as prescribed in Appendix D.

8. CARE AND MAINTENANCE

8.1 Guidance on the care and maintenance of brushes is given in IS : 3451 (Part 2)-1975¶.

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*Lindane dusting powder — Specification.

†Specification for methyl parathion dusting powders.

‡Specification for French chalk, technical (*second revision).*

§Specification for naphthalene (*second revision*).

¶Code of practice for care and maintenance of brushes : Part 2 Brushes other than pan set brushes.

APPENDIX A

(*Clause* 3.1.2.1)

SPECIES OF TIMBER FOR THE MANUFACTURE OF WOODEN PORTION OF BRUSH, CARRIAGE WASHING (WITHOUT HANDLE)

A-1. The list of species of timber approved for the manufacture of the wooden portion of brush, carriage washing (without handle) is given below:

Trade Name		*Botanical Name*
Roman	Devanagari	
Aini	ऐनी	*Artocarpus hirsuta* Lamk., fam. Moraceae
Banati	बनाती	*Lophopetalum wightianum* Am., fam. Celastraceae
Badam	बादाम	*Prunus amygdalus* Batsch., fam. Rosaceae
Bijasal	बीजसाल	*Pterocarpus marsupium* Roxb., fam. Leguminoseae
Champak	चम्पक	*Michelia champaca* Linn., fam. Magnoliaceae
Chickrassi	चिकरासी	*Chukrasia tabularis* A. Juss., fam. Meliaceae
Dhaman	धामन	*Grewia tiliifolia* Vahl., fam. Tiliaceae
Gamari (gumhar)	गमारी (गुम्हार)	*Grneiina arborea* L., fam. Verbenaceae
Haldu	हल्दु	*Adina cordifolia* Hook, f., fam. Rubiaceae
Kairn	कैम	*Mitragyna parvifoiia* Roxb., Korth., syn. *Stephegyne parvifolia* Korth., fam. Rubiaceae
Kanju	कांजू	*Holoptelea integrifolia* Roxb., Planch., fam. Ulmaceae
Kathal	कटहल	*Artocarpus heterophyllus* Lamk. syn. *A. integrifolius* Auct., fam. Moraceae
Kuthan	कूथन	*Hymenodictyon excelsum* Wall., fam. Rubiaceae

Trade Name		*Botanical Name*
Roman	Devanagari	
Lambapatti	लम्बापत्ती	*Planchonella longipetiolatum* H. J. Lam., syn. *Sideroxylon longipetiolatum* King & Prain, fam. Sapotaceae
Aam (mango)	आम (मैन्गो)	*Mangifera indica* Linn., fam. Anacardiaceae
Nim-chameli	नीम-चमेली	*Millingtonia hortensis* Linn., fam. Bignoniaceae
Kodapalai choupaini (piney)	कोडपलई चौपेनी (पिने)	*Kingiodendron pinnatum* Harms, syn. *Hardwickia pinnata* Roxb., fam. Leguminoseae
Toon	तून	*Toona ciliata* Roem., syn. *Cedrela toona* Roxb., fam. Meliaceae

APPENDIX B

(*Clause* 3.1.2.2)

DETERMINATION OF MOISTURE CONTENT OF TIMBER

B-1. TEST SPECIMEN

B-1.1 The entire block used in the brush may form the test specimen for determination of moisture content or a coupon cut from the test specimen may be used. When for any reason additional determination of moisture content is required, separate samples shall be prepared from the same material as is used in preparing the test specimens. Smaller specimens may be used when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B-2. PROCEDURE

B-2.1 Weigh accurately each test specimen. Dry in a ventilated oven at a temperature of 105 ± 2°C until the mass becomes constant between two successive weighings made at an interval of not less than one hour.

B 3. CALCULATION

B-3.1 The moisture content, expressed as a percentage of the oven-dry mass. is given by the following formula:

$$\text{Moisture content, percent of oven-dry mass} = \frac{M_1 - M_0}{M_0} \times 100$$

where

M_1 = initial mass in g of the test specimen, and

M_0 = oven-dry mass in g ot the test specimen.

APPENDIX C

(*Clause* 3.5.2.1)

METHOD FOR DETERMINING PROPORTION OF COW TAIL HAIR AND COCOFIBRE

C-1. APPARATUS

C-1.1 Glass Beaker — 1 000-mm capacity.

C-1.2 Glass Measuring Cylinder — 500-ml.

C-2. REAGENTS

C-2.1 Sodium Hydroxide Solution — 5 percent (*m/v).*

C-2.2 Acetic Acid Solution — 2 percent (*m/v).*

C-3. PROCEDURE

C-3.1 Take at random a few complete tufts of filling material from the brush. Cut them about 25 mm in length and condition at 27 ± 2°C and 65 ± 5 percent relative humidity for 24 hours. Weigh 4 to 5 g (M_1) of material and take in a beaker. Add 500 ml of sodium hydroxide solution into the beaker and dip the fibres completely into the solution by means of a glass rod. Heat the mixture on a small flame till the solution boils uniformly and briskly.

C-3.2 Continue boiling for 15 minutes with occasional stirring taking care that during boiling all the fibres are uniformly acted upon by the solution. Dilute the solution with distilled water to about 1 000 ml. Filter the solution through a Buchner funnel fitted with *malmal* cloth keeping bulk of the fibre in the beaker. Wash all the fibres 6 to 8 times with distilled water and filter through the Buchner funnel till it becomes almost free from alkali. Then wash the fibres with acetic acid solution for neutralizing the traces of alkali and until they assume a pale yellow colour. Finally wash again 2 to 3 times with distilled water. Collect all the fibres and dry them to constant mass in an air-oven at 100 ± 2°C. Take out from the oven and condition for 24 hours at 27 ± 2°C and 65 ± 5 percent relative humidity and then take the final mass (M_2) of the extracted fibres.

C 4. CALCULATION

C-4.1 Cocofibre, percent by mass $= \frac{M_2 \times K \times 100}{M_1}$

where

M_2 = mass of extracted fibres, and

K = 1.26 correction factor for loss of lignin of cocofibre in alkali.

M_1 = mass of filling material taken for test,

C-4.2 The percent by mass content of cow-tail hair shall be 100 minus cocofibre content, percent by mass.

C-5. REPORT

C-5.1 Report the mean value of five determinations as the ratio of percent of cocofibre and cow-tail hair.

APPENDIX D

(*Clause* 7.1)

SAMPLING AND CRITERIA FOR CONFORMITY

D-1. SCALE OF SAMPLING

D-1.1 Lot — In any consignment, all the brushes of the same size and quality shall be divided into groups of 500 brushes or less and each such group shall constitute a lot. Care shall be taken to ensure that brushes included in a lot do not differ in construction as far as possible.

D-1.2 The conformity of the brushes in a lot to the requirements for this specification shall be ascertained for each lot separately. The number of brushes to be selected for this purpose shall be in accordance with Table 1.

TABLE 1 SCALE OF SAMPLING

NO OF BRUSHES IN THE LOT N (1)	NO OF BRUSHES TO BE SELECTED n (2)
Up to 10	2
11 to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 to 500	8

D-1.3 The brushes shall be selected at random. To ensure randomness of selection one of the following procedures, whichever is suitable, may be followed:

a) If all the brushes in a lot are packed in one box, then starting from any brush, count them in any suitable order as 1,2........ up to r and so on, where r is the integral part of N/n (N and n being the lot size and sample size respectively). Every rth brush thus counted shall be withdrawn to constitute the sample.

b) If the brushes in a lot are packed in more than one box, approximately equal number of brushes shall be picked up at random from as many boxes as possible so as to obtain the required number of brushes as specified in Table 1.

D-2. CRITERIA FOR CONFORMITY

D-2.1 For declaring the conformity of the lot to the requirements of this specification, all the brushes selected according to **D-1.2** and **D-1.3** shall satisfy the relevant requirements given in 3.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg m/s^2
Energy	joule	J	1 J = 1 N m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^1)
Electric conductance	Siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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This Indian Standard has been developed by Technical Committee CDC 31 and amended by CHD 24

Amendments Issued Since Publication

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Amd No 2	September 2004

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